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(54) **Burner System**

(57) A burner system for combustion of coal-dust comprises radiant burners 1, 2 arranged in a row and a coal-dust ignition burner 3 arranged between two radiant burners. The ignition burner comprises an ignition dust tube (6) disposed concentrically around an ignition device (5) and a jacket air tube (7) surrounding the ignition dust tube. The jacket air tube has swirl vanes (8) at its inlet and a conically widening outlet (9) which opens into the combustion chamber.

Fig. 1

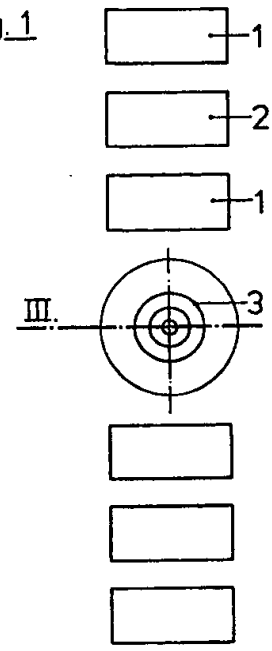
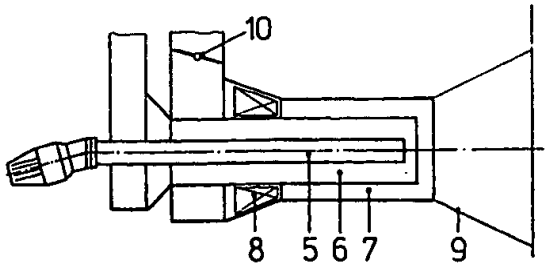


Fig. 3



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The drawing originally filed was informal and the print here reproduced is taken from a later filed formal copy.

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Fig. 1

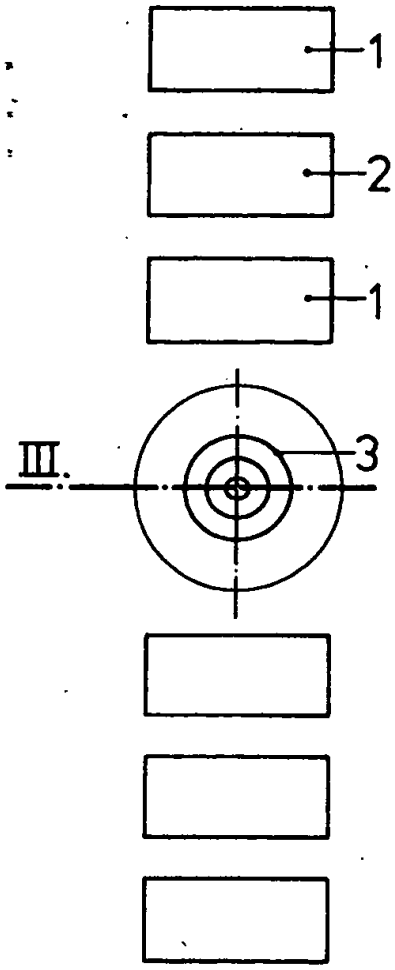


Fig. 2

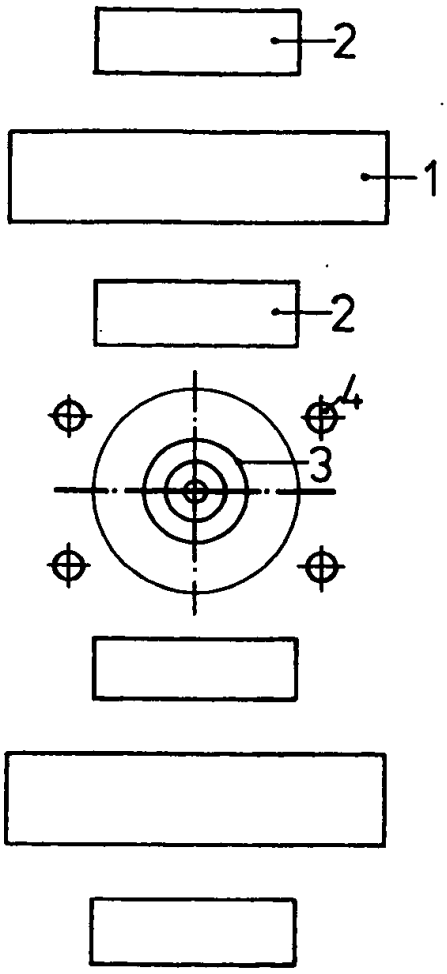
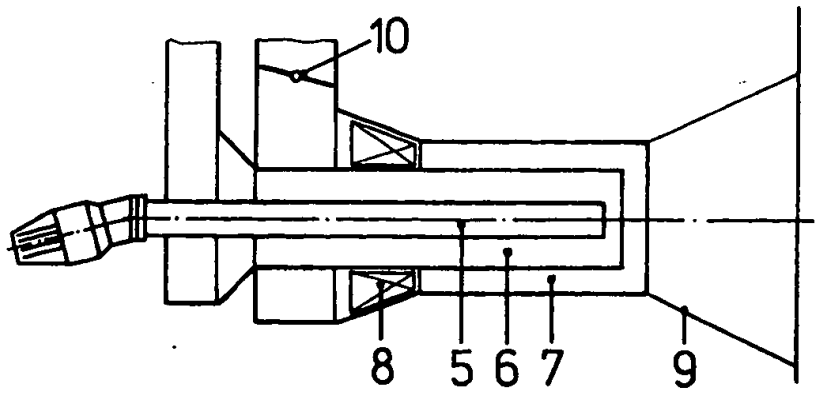


Fig. 3



SPECIFICATION
Burner System

This invention relates to a burner system of the kind comprising a plurality of radiant burners disposed in a row with associated dust ignition burners for the combustion of fuels in the form of dust.

In the burner systems hitherto known, which consist of a plurality of radiant burners disposed in a row, the ignition of the fuel in the form of dust is effected via additional dust ignition burners which are operated by natural gas or oil. Oil or gas is used as an ignition energy carrier in view of its readiness to ignite and combustion stability, which is necessary in particular with cold combustion chamber influences. For reasons of cost and of the available reserves it is becoming ever more desirable to use coal or another solid fuel as ignition fuel instead of natural gas or crude oil as an ignition energy carrier, particularly for coal-dust furnaces.

It is therefore the object of the present invention to be able to use, in a burner system of the kind described above a dust ignition burner wherein a solid fuel prepared in the form of dust can be used as an ignition energy carrier.

In order to solve this problem, it is proposed, according to the invention, to associate with a system of two radiant burners, a coal ignition burner in the form of an annular burner with a dust ignition tube disposed concentrically round an ignition device and a jacket air tube surrounding the ignition dust tube for the ignition dust flame with an axially displaceable ring of swirl vanes disposed at its air inlet as well as a conically widening outlet, and to dispose the dust ignition burner on the connecting line between two radiant burners.

In order to ignite the dust ignition burner, its igniter may be operated gas-electrically, oil-electrically or purely electrically.

The jacket air for the dust ignition burner and the jacket air for radiant burners may be supplied through separate passages with regulating flap valves, both air passages being in communication with the master air passage.

The ratio of the axial length of the outlet cone of the dust ignition burner to its jacket air tube diameter preferably amounts to 0.5 to 1.5.

In a preferred embodiment of the invention, additional air nozzles are associated with the dust ignition burner to the side of the connecting line of the radiant burners and are adjustably connected to the main air supply of the dust ignition burner.

Embodiments of the invention will now be described, by way of example, with reference to the accompanying drawing, in which:

Figure 1 shows in elevation one embodiment of a burner system according to the invention.

Figure 2 shows, in elevation, another embodiment of a burner system according to the invention,

Figure 3 shows a section on the line III—III of Figure 1.

The burner system according to Figure 1 provides that, according to the invention, a dust ignition burner 3 is disposed between two radiant burners with a fuel dust nozzle 2 disposed between two air nozzles 1. In the example of Figure 2, radiant burners are used wherein the dust nozzles 2 are disposed symmetrically in relation to the air nozzle 1. The dust ignition burner 3, which is illustrated in section in Figure 3, is composed in the following manner: The ignition dust tube 6 and the jacket air tube 7 are disposed in a concentric arrangement round an igniter 5. In the jacket air tube 7 there is an axially displaceable ring of swirl vanes 8. The outlet to the combustion chamber forms an opening 9 which widens out conically. The air supply to the ring of swirl vanes can be regulated via a flap valve 10.

The burner system according to the invention may be used both for tangential firing and for overhead firing. Burner systems as described with specially constructed dust ignition burners from the arrangement and constructional point of view have the advantage that an annular burner with great ignition stability ensures a reliable ignition of the main fuel for the fuel dust which is generally difficult to ignite in comparison with oil or gas.

The operation of the dust ignition burner 3 is effected under-stoichiometrically because of the more favourable ignition conditions which are then present. The amount of additional air necessary for the residual burning is either supplied by the leakage air from the adjacent air nozzles 1 (see the embodiment according to Figure 1) or, with adjacent dust nozzles 2 in accordance with the embodiment shown in Figure 2, via the air nozzles 4 disposed additionally at the side in the annular burner.

Claims

1. A burner system composed of a plurality of radiant burners disposed in a row with associated dust ignition burners for the combustion of fuels in the form of dust, characterised in that associated with at least one system of two radiant burners is a coal-dust ignition burner in the form of an annular burner with an igniting dust tube disposed concentrically round an ignition device and a jacket air tube surrounding the igniting dust tube for the igniting dust flame with an axially displaceable ring of swirl vanes disposed at its air inlet as well as a conically widening outlet, and the coal-dust ignition burner is disposed on the connecting line between two radiant burners.

2. A burner system as claimed in claim 1, characterised in that the igniter of the dust ignition burner is operated gas-electrically, oil-electrically or purely electrically.

3. A burner system as claimed in any one of the claims 1 and 2, characterised in that separate supply passages with air-regulating flap valves are provided for the jacket air of the dust ignition

burner and of the radiant burner and both air passages are in communication with the master air passage.

4. A burner system as claimed in claims 1 to 3, characterised in that the ratio of the axial length of the conical outlet of the dust ignition burner to its jacket air tube diameter amounts to 0.5 to 1.5.

5. A burner system as claimed in any of claims 1 to 4, characterised in that additional air nozzles are associated with the dust ignition burner to the side of the connecting line of the radiant burners and are adjustably connected to the main air supply of the dust ignition burner.

6. A burner system substantially as hereinbefore described with reference to Figures 1 and 3 or Figures 2 and 3 of the accompanying drawing.

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